Model/Option Development Process
Functional Definitions

- Functions were identified having primary characteristics which could be used in differentiating models of an NGO. The primary characteristics included:
  - Science/Technology/Commercial (S/T/C) Leadership
  - Sustaining Payloads
  - Developing Payloads
  - Mission Management and Operations
  - Engineering
- Characteristics were subsequently additive to reflect increasing levels of responsibility, e.g., Leadership + Sustaining Payloads (C).

NOTE: Those elements reflecting an inherently government function (policy and strategic plans – [Function 0]), the user (conduct of research and analysis [Function 17]), and Safety [Function 12] are not within the purview of an NGO.

Model/Option Development Process
Functional Definitions, cont'd

Science/Technology/Commercial Leadership

Leadership reflects a level of responsibility and accountability, which the User and other External entities recognize as *managing* and as *providing leadership* in ISS Utilization Management (e.g. RPWG) including:

- Implementing strategic plans and managing research programs (1.1, 1.2)
- Formulating and implementing budgets along with costs, schedule, and risk (2.0, 5.0)
- Advocating, selecting, and prioritizing research (3.0)
- Manifesting and resource allocations (13.1, 13.2, partial 13.3)
- Outreaching to public and industry (18.0)
- Recommending and implementing ISS process improvements (19.0)
- Managing archival of data (engineering, environmental, samples not held by the experimenter) (20)

Leadership must be provided objectively in order to avoid the appearance of conflict of interest.

Model/Option Development Process
Functional Definitions, cont'd

Sustaining Payloads

Sustaining Payloads involves maintenance and refurbishment of the flight experiment support hardware and software and associated ground systems developed for research aboard ISS. This includes the racks and pallets where the hardware/facility is located. This is a recurring function and will require a level of engineering competence. (7.0, 9.0)

Model/Option Development Process
Functional Definitions, cont'd

Developing Payloads

Developing payloads (6.0) involves design, development, test, integration, and evaluation of the S/T/C facilities, payloads and ground systems (8.0) to conduct research. It also includes the development of S/T/C experiment requirements and feasibility (4.0) and resultant experiment unique hardware and supporting ground tests to conduct experiments on ISS. Recurring elements include:

- Sub-rack integration of experiment unique elements, performing accompanying engineering analysis, and providing their resultant products (6.0, 7.0)
- Operations elements as training, simulations, timeline, flight real-time support for logistics, anomaly resolution, data capturing
- Logistics including sparing inventory, bonded stores, shipping/receiving to/from launch/landing site

Model/Option Development Process
Functional Definitions, cont'd

Mission Management/Integrated Operations

Mission Management implements the requirements and priorities established by the S/T/C Leadership function and provides integration of all execution-level elements in each mission and includes:

- Detailed manifesting and allocating services by flight/increment (13.3, 14.1, 14.2)
- Integrating all S/T/C users
- Chairing Boards approving hardware and experiment elements
- Interfacing to ISS/STS/ETOV elements

Integrated Operations elements include: (14.3, 16.0)

- Planning
- Training
- Integrating crew procedures, experiment displays, etc.
- Retrieving flight data for S/T/C elements and ancillary data
- Real-time flight operation

Model/Option Development Process
Functional Definitions, cont'd

Engineering

Engineering is the integration (both analytical and physical) of all data, software, and hardware products submitted as part of an ISS mission. It includes both internal and external elements. Typical tasks include: design and development of hardware and software, verification of hardware (mechanical and electrical) and software through test and analyses, and integration of hardware and software into a whole system. Engineering tasks are further elaborated under definitions:

- 6.2-6.9
- 7.2-7.8
- 8.0-8.41
- 9.2.3
- 14.0
- 15.3
- 16.0